## TECHNOLOGY INTEGRATION FOR MEANINGFUL CLASSROOM USE

Course 1 math ~ Grade 6 (20 students)

**Lesson Plan**

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| Lesson Title:  The Snack Store | Related Lessons:  Students conducted a survey to find out which starburst flavor was the most popular amongst their grade level |
| Time: Two 90 Minutes Class Periods | **Unit:** Measures of Central Tendency |
| **GOALS:**  The student will use problem solving, mathematical communication, mathematical reasoning, connections and representations to:   * Find the mean for a set of data. * Describe the three measures of center and a situation in which each would best represent a set of data. * Identify and draw a number line that demonstrates the concept of mean as balance point for a set of data. | |

Content Standards:

The student will

a. describe mean as balance point; and

b. decide which measure of center is appropriate for a given purpose.~ Currently, there are no published technology content standards in Maryland at the elementary level.

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| ISTE NETS-S:  Creativity and innovation  Communication and collaboration  Research and information fluency | Critical thinking, problem-solving, & decision-making  Digital citizenship  Technology operations and concepts |

**Bottom of Form**

Instructional Objective(s): Students will work in groups of three or four to select items that should be sold in the school’s snack sure through use of data collection and analysis.

**Lesson Overview**: Fairfield Middle School is considering opening a snack store to run before and after school. The school needs help to determine the type of soft drinks, chips, candy, and cookies to sale to the students and staff. Using data analysis each group will be responsible for selecting the top two items to sale for each category.

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| Group A: Soft Drinks | Group B: Chips | Group C: Candy | Group D: Cookies |
| Cola | Potato Chips (Plain) | M&Ms | Oatmeal Cookies |
| Lime | BBQ chips | Starburst | Chocolate Chip Cookies |
| Grape | Sour Cream and Onion Chips | Skittles | Peanut Butter Cookies |
| Orange | Salt and Vinegar Chips | Fruit chewable | Sugar Cookies |
| Fruit Punch | Doritos | Jolly Ranchers | Macadamia Cookies |
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Each group must creatively present their findings using multimedia such as a PowerPoint, Commercial, or webpage. The presentation must include the method used for collecting the data, the sample population, and the member’s name that collected the data. All students must collect data from at least 10 teachers and or students. During the presentation student 1 must present the overview of their group’s problem (topics). Student 2 must present the method for collecting data, student 3 will present the finding, and student 4 will explain the data (measure of central tendency).

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| **ACTION** | | |
| Before-class preparation: Teacher provides student with websites that can be useful for creating surveys to collect data. Students use [www.Googledocs.com](http://www.Googledocs.com) or [www.pollseverywhere](http://www.pollseverywhere) to create a survey for their family member to decide which desserts will be served at thanksgiving dinner. The teacher will go over the measure of central tendency with the students and then allow them time to analyze the mean, median, and mode using the data that they collected. | | |
| During class  Day 1: Introduction to Measure of Central Tendency  Student/Teacher Actions (what students and teachers should be doing to facilitate learning)  Prior to the lesson, create a large number line on which students may affix markers. The number line should start at 0 and extend through at least 20.   1. Begin the lesson by reviewing the importance of statistics in describing, summarizing, and making inference about data. Continue by defining *measures of center* and asking students for their personal definitions of *mean, median,* and *mode.* Work through the processes of determining values for measures of center and range. 2. Ask students about the methods they have used previously to calculate the mean of a data set. This should prompt a discussion of the mean as fair share (SOL 5.16). Also, include the definition of *mean* as the average of all data values. 3. Distribute sticky notes. Poll the class with a specific question to generate data. Choose a question such as one of the following that will have a variety of responses over a fairly wide range:  * How many relatives live within 100 miles of you? * How many states have you visited? * How many family vacations can you remember? * How many books have you read this year? * How many video games do you have?   Have each student record her/her response to the question by placing a sticky note marker at the appropriate number on the number line.   1. After each student has placed a marker on a specific data value, explain that *mean* can also be represented as the balance point of the data. Discuss the meaning of *balance point.* Illustrate balance point by balancing a ruler on your finger, centering it on your finger until it does not fall off. 2. Using the data markers on the number line, start finding the balance point by moving two of the outermost data values (values farthest to the right and to the left) towards each other one unit. Continue this process until all values have been moved towards a center point and are stacked on top of each other at one number. This number is the balance point or mean of the data set. 3. Finally, give the formal definition of the balance point or *mean*: the point on a number line where the data distribution is balanced. This means that the sum of the distances from the mean of all the data points above the mean is equal to the sum of the distances of all the data points below the mean. This is the concept of mean as the balance point. (SOL 6.15, Curriculum Framework) Connect this definition to the class data set prior to the rearrangement, as well as to the illustration of balancing the ruler.  Assessment  * + Questions * What are some challenges that may be faced when using this method for calculating the mean of a data set? * How can we verify the mean of a data set mathematically?   + Journal/Writing Prompts * Explain how to decide when mean is the best measure of center to describe a data set. * Explain how to decide when mode is the best measure of center to describe a data set. * Explain how to decide when median is the best measure of center to describe a data set. * Explain why a measure of center is important when analyzing data.  Extensions and Connections (for all students)  * Have students also find the median and mode for this data set. Based on the values, have them determine which value depicts the best measure of center for this specific data set and explain why.  Strategies for Differentiation  * Show students the actual calculation associated with deriving the balance point or mean prior to use of the number line. * Prior to building up the concept of mean as the balance point, show an example, including manipulatives, of mean as fair share. | | |
| Time | Instructional Activities | Materials & Resources |
| Day 2  5 minutes  5 –7 minutes  30 minutes  5 – 7 minutes  5 Minutes Day 3 10Mins  50 minutes Day 4 10 minutes  50 minutes | Warm-up-Students will write a journal on why statistics is useful in the real world.  ~Teacher identifies groups (5 groups of 4 students)  ~students are groups heterogeneously and students with special needs are equally distributed among the groups  ~Students will work in small groups in the classroom. They will be assigned one food item: soft drinks, candy, cookies, or chips to investigate which flavors/types should be sold in the school store based on teacher and student preferences. Accommodations will be available for students with special needs as required by their IEP. Each student will also learn their job assignment within the group and understand the responsibilities for each role. Using the rubric, students will strategies how they can find a solution to their problem and which technology resources they can use to collect  And organize data.  Each team will submit a 3-2-1 documents where they state three things that they got accomplished, 2 things that’s they are unclear about with the projects, and 1 thing that they need to work on next class.  Teacher explains to the class that they must have all of their data collected before the next class period. Each team member should collect data for at least 10 teachers/students. Teacher reads over the rubric with the students.  Warm Up- Students will write then discuss their method for collecting data for the assignment.  Students will work in their groups to analyze their teams’ data and decided on which multimedia they will use to creatively display their findings. Project will be due during the next class-therefore students may need to work together outside of school. The teacher recommends that the students use GoogleDoc.com to edit their work when they are away from the school.    Warm-up Students will do a peer review rubric for each group member’s participation to the project.  Each team will present their projects to the class. | -Journal  Each student will need their school issued laptop  ~Rubric Guidelines and Handout  ~Group Journal  Rubric  Laptop  Laptops  Rubric  Peer Review Document  LCD projector, speakers (sound cord), Class Microphone, Laptop |

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| MONITOR |

Ongoing assessment(s):

Formative Assessments: Journals, Teacher Observations, Group Journals, Daily Rubric Completions

Summative Assessment: Peer Evaluations and Project Rubric Grade

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| EVALUATE AND EXTEND |

Lesson reflections and notes:

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| REFERENCES |

Education, V. D. (2011). *Balacing Act* . Retrieved January 30 , 2013 , from Mathematics Enhanced Scope and Sequence: http://www.doe.virginia.gov/testing/solsearch/sol/math/6/mess\_6-15ab.pdf